

# **IOWA HIGHWAY RESEARCH BOARD**

*Minutes of February 27, 2004*

## **Regular Board Members Present**

|             |                |
|-------------|----------------|
| J. Adam     | L. Jesse       |
| R. Ettema   | J. Krist       |
| T. Fonkert  | M. Nahra       |
| R. Gould    | G. Parker      |
| L. Greimann | C. Schloz      |
| J. Ites     | C. Van Buskirk |

## **Alternate Board Members Present**

|                            |                |
|----------------------------|----------------|
| G. Miller for J. Selmer    | S. Camp        |
| J. Rasmussen for C. Marker | R. Schletzbaum |
| A. Abu-Hawash              | B. Younie      |

## **Board Members With No Representation**

L. Brehm

## **Secretary**

M. Dunn

## **Visitors**

|                    |  |
|--------------------|--|
| Max Grogg          | <i>FHWA</i>                              |
| Gordon Smith       | <i>Iowa Concrete Paving Association</i>  |
| Sara Buseman       | <i>Iowa Department of Transportation</i> |
| Dave Claman        | <i>Iowa Department of Transportation</i> |
| Ed Engle           | <i>Iowa Department of Transportation</i> |
| Sandra Larson      | <i>Iowa Department of Transportation</i> |
| Judy McDonald      | <i>Iowa Department of Transportation</i> |
| Mohammad Mujeeb    | <i>Iowa Department of Transportation</i> |
| Jim Rost           | <i>Iowa Department of Transportation</i> |
| Jim Cable          | <i>Iowa State University/CCEE</i>        |
| Roy Gu             | <i>Iowa State University/CCEE</i>        |
| Radhey Sharma      | <i>Iowa State University/CCEE</i>        |
| Dave White         | <i>Iowa State University/CCEE</i>        |
| Steve Andrle       | <i>Iowa State University/CTRE</i>        |
| Tom Cackler        | <i>Iowa State University/CTRE</i>        |
| Shauna Hallmark    | <i>Iowa State University/CTRE</i>        |
| Dale Harrington    | <i>Iowa State University/CTRE</i>        |
| Tom Maze           | <i>Iowa State University/CTRE</i>        |
| Duane Smith        | <i>Iowa State University/CTRE</i>        |
| Joe Artz           | <i>The University of Iowa</i>            |
| Thanos Papanicolau | <i>The University of Iowa</i>            |

**The meeting was held in the East/West Materials Conference Room at the Iowa Department of Transportation, Ames, Iowa. The meeting was called to order at 9:00 A.M. by Greg Parker.**

**Agenda review/modification**

- No additions or modifications.

**Approval of the minutes**

- Christy Van Buskirk moved to approve the minutes from the December 11, 2003 meeting with no additions or corrections. Glen Miller seconded. Carried with 14 yes, 0 no, and 0 abstaining.

**Review of proposals from 2<sup>nd</sup> Solicitation for FY 03-04**

***IHRB 03-14, Decision Support Model for Assessing Archaeological Survey Needs for Bridge Replacement Projects in Iowa***

- By decision of the Board, this topic was a sole source solicitation. One proposal was received from Joe Artz, Office of the State Archaeologist, The University of Iowa.
- *Comments/Discussion:*
  - There has been advocacy for a number of years from an archaeologist in northeast Iowa for developing a protocol by review of landform and landmass, to determination whether or not the areas have potential for archaeological finds.
  - The potential savings to counties, and possibly to the state as well, was mentioned as a positive aspect of this project.
  - It was asked if Indian tribes were aware of the development of this model. Needed consultation with the tribes will continue as it is currently done and they are provided information on projects. With the way the review and communication of projects is handled now, it doesn't appear that the use of this model would make any difference in that regard. If information is doubtful, there will be a survey.
  - An outline of history in the proposal presented that out of 3200 bridge projects that were looked at, 900 of them had aspects that would have needed Phase I and Phase II type reviews. With \$800 to \$1000 per a Phase I review, that would be a considerable savings.
  - It was mentioned that the list of acronyms in the front of the proposal was very useful and a good addition to the proposal format.
- *Issues/Concerns that the board would like staff to address:*
  - None
- *Vote to approve:*
  - Mark Nahra moved to accept the proposal. John Adam seconded. Carried with 13 yes, 0 no, and 1 abstaining.
  - Mark Nahra moved that the funding levels be split 45% Primary and 55% Secondary. Jon Ites seconded. Carried with 13 yes, 0 no, and 1 abstaining.

***IHRB 03-15, Development of a Manual of Practice for Roadway Maintenance Workers***

- One proposal was received from Duane Smith and Dr. Charles Jahren, Iowa State University.

- *Comments/Discussion:*
  - Printing of the final manual was discussed. It was decided that the DOT will do the printing of the final (as proposed), however if it is felt by the principal investigator and the advisory committee that special printing (i.e. reference cards or pocket guides) would be more beneficial for the technology transfer part of the research, a separate request should be brought back to the Board to review the additional funding option at that time.
- *Issues/Concerns that the board would like staff to address:*
  - None
- *Vote to approve:*
  - John Adam moved to accept the proposal with the above stated printing amendment for technology transfer, if necessary. Todd Fonkert seconded. Carried with 14 yes, 0 no, and 0 abstaining.
  - Mark Nahra moved to have the funding level set at 100% Secondary. Clark Schloz seconded. Carried with 14 yes, 0 no, and 0 abstaining.

***IHRB 03-17, A Guide for Monitoring and Protecting Bridge-Waterways Against Scour***

- Competing proposals were received from Drs. Robert Ettema, Thanos Papanicolaou, Marian Muste, and Tatsuki Nakato, The University of Iowa (U of I) and Dr. Roy Gu, Iowa State University (ISU).
- *Comments/Discussion:*
  - The U of I proposal was complimented on pulling knowledge from experienced staff from counties, cities and DOT (including Bridge Inspection). The U of I proposal also referenced the scour diagnosis tools that are already out there.
  - The ISU proposal seemed to be written to be more internal to ISU, without discussion of an expert committee assisting the project.
  - The budget difference between the two proposals was noted. The U of I proposal added a Phase II (demonstration component) and a separate budget for additional work outside of the RFP scope for the Board's consideration. Note: The solicitation letter, which accompanies the RFPs, invites this approach, when appropriate, for the Board's consideration.
  - Dave Claman, Iowa DOT Office of Bridges and Structures, was asked his view about the Phase II research. The U of I had met with the DOT about the research. First from that meeting, it was felt that it would be beneficial research, however the DOT bridge inspectors already do much of what is proposed to be put in the manual. It would likely be a more useful tool for counties and consultants. Second, in the discussion about the additional barb proposal being included in the manual, it was felt that due to a timing and coordination standpoint, it was best to keep the two as separate entities.
  - It didn't seem that there was any time issue that would push the need for the U of I Phase II to be done now. The issue of right-of-way is still being worked with as well. It was agreed that Phase I and II seemed like independent proposals.
  - Dave Claman was asked what the main benefits would be from the U of I Phase II research. Iowa hasn't done much with barbs and bendway weirs and this would give an idea of how well they function compared to other approaches, a cost comparison on different options, and a study on the environmental effects.
  - It was said that Phase I of the U of I proposal seemed more responsive to the RFP compared to the ISU proposal.
  - After discussion, it was recommended that the Phase II portion of the U of I proposal be kept separate and put into the group of topics to be considered for research priorities for the

upcoming fiscal year. This would allow for competition for proposals received on this topic if it ranks high enough for solicitation.

- Since the budgets were kept separate, it was decided that the U of I did not need to resubmit a changed proposal to the Board.
- *Vote to select proposal:*
  - Mark Nahra moved to select The University of Iowa proposal, Phase I only. Roger Gould seconded. Carried with 12 yes, 0 no, and 2 abstaining.
- *Issues/Concerns that the board would like staff to address:*
  - None
- *Vote to approve funding split:*
  - Mark Nahra moved that the funding levels be split 40% Primary, 55% Secondary, and 5% Street. John Adam seconded. Carried with 12 yes, 0 no, and 2 abstaining.

**Proposal for TR-496, “Development of Standard Plans for the Design of Single Span Pretensioned, Prestressed Concrete Beam Bridges with Concrete Abutments”**

- This project was one of the previous priority projects that the Board recommended to be approached through a consultant selection process. Stanley Consultants was selected for the work. Mark Dunn briefly explained the scope: 1) updating the timber abutment standards for the single span bridges by replacing the beam sheets and redrawing the CAD files, and 2) development a new set of standards which would be numbered with a slightly different designation with concrete abutment alternatives in approximate 10’-15’ increments, from 46 ½’ up to 110’.
- It was mentioned that the last update for the J standards cost approximately \$400,000 and the culvert updates cost approximately \$200,000.
- There was discussion on the counties use of Autocad not Microstation. The Iowa DOT Office of Bridges and Structures will be maintaining the plans and they use Microstation. The possibility of having the Service Bureau convert the plans was mentioned.
- It was reiterated that this was a high priority for the counties.
- John Adam moved to approve the proposal with 100% Secondary funding. Glen Miller seconded. Carried with 14 yes, 0 no, and 0 abstaining.

**Problem Statement/ Scope Amendment for TR-492, “Embankment Quality Phase IV: Measurements of Seasonal Changes and Spatial Variation in Pavement Subgrade Support Properties - A Link to Pavement Performance”**

- Dr. David White, Iowa State University, presented the background of “Embankment Quality Phases I-IV”; the problem statement and considerations of the proposed research; charts and data shots showing spatial variation, soil variability, influence of temperature, and moisture content; summary of moisture conditions; overview of instruments needed for testing; objectives; tasks; implementation plan; funding and schedule of the scope amendment.

- There is a broad range of materials that could be tested. It is proposed to initially focus on some select soil materials, such as a glacial till and loess. If they perform poorly, then other materials would need to be looked at as well. If they perform okay, the materials may be fine to use and much could be learned from this starting point.
- It was clarified that air and subgrade temperatures would both be monitored.
- This research may be easier to implement on the state level, because the cities and counties frequently end up using what is at hand for the project being done. However, the information will be a helpful tool for the design process to help quantify the variability.
- A major part of this project is to see how it performs over time with regard to moisture.
- The Board discussed if the problem statement/scope amendment should be treated as a proposal. It was currently submitted with all of the required information, including budget and would not have any additional information for consideration if submitted to the Board at the April meeting as a proposal.
- Larry Jesse moved to approve the problem statement/scope amendment as a proposal with the funding split of 75% Primary, 15% Secondary and 10% Street. Glen Miller seconded. Carried with 14 yes, 0 no, and 0 abstaining.

#### **Final Report for TR-420, “Field Evaluation of Alternative Load Transfer Device Locations in Low Traffic Volume Pavements”**

- Dr. Jim Cable, Iowa State University, presented the project problem statement, locations and descriptions of the test areas, the test procedure, different dowel basket combinations, and findings of the research.
- It was clarified that the urban test section did not have curbs.
- For twelve inch dowel bar spacing, transverse joint costs are approximately \$2.00 - \$2.40/ft. Dowel bars are a significant cost in a paving project.
- It was discussed that on the rural section, from a construction and statistical standpoint, that the full dowel baskets might be a better option. However, it is also agreed that on some county roads it is tough to get the full baskets in due to no shoulder. Also, putting full baskets in an Iowa Special paving project really slows down the process.
- The difficulties stated above also brought up the opportunity to consider spending a little money on the subgrade in the way of stabilization with fly ash from Dr. White’s research. If the foot under the pavement is made more uniform, then it may be possible to do fewer dowels.
- Jeff Krist moved to approve the final report. Jon Ites seconded. Carried with 14 yes, 0 no, and 0 abstaining.

## **Final Report for TR-490, “Stringless Portland Cement Concrete Paving”**

- Dr. Jim Cable, Iowa State University, presented the background; paving summary, including equipment issues and changes made during pavement; the issue of paving incentives for smoothness with this process; and program improvements for future paving.
- There was concern expressed about the comment made in the report that smoothness is up to designer not up to contractor. It was clarified that the contractor can only perform as well as the information that is originally received from the design engineer; however, it is true that the contractor has responsibility for their performance with the actual paving process. The contractor needs to be able to check deviations from the design as quality control. Both sides hold responsibility, but things are based on the quality of information received from the design engineer.
- The possibility of tying in the research being done on smoothness checks right behind the paver was discussed. The concept has been talked about to have a sensor on the front of the paver to look at subgrade and double check that it is where it was thought to be and have a sensor on the back end, looking at the profile to make sure there isn't deviation from the standard profile. This is possible and things are getting close to being usable in a field test.
- Some ways to overcome the technical difficulties in the process were discussed. One option is the have a GPS receiver on both sides of the paver so if one is blocked, the other can pick up the satellite. There can also be adjustments made with the lasers and there can be software adjustments to help. Many things were adjusted and learned throughout this project and things looks very optimistic for the technology in the future.
- Larry Jesse moved to approve the final report. Christy Van Buskirk seconded. Carried with 14 yes, 0 no, and 0 abstaining.

## **Review of Business Plan, annual calendar and annual budget allocations**

### ***Business Plan***

- Mark Nahra moved to approve the Business Plan as submitted. Rob Ettema seconded. Carried with 13 yes, 0 no, and 0 abstaining.

### ***Annual calendar***

- It was pointed out that meetings are not held in the months of March, August, or November.
- The April and May meetings have been adjusted one week ahead of the regularly scheduled last Friday of the month this year, to avoid having the meeting the Friday before Memorial Day and to allow enough preparation time between meetings.

### ***Annual budget allocations***

- It was reviewed that the Street Research fund receives additional funding July 1 of each year. Now that the FY 03-04 solicitations are complete, there will not likely be major funding requests until after July 1, 2004.
- The balance of the Secondary Road Research fund was discussed. That money comes in throughout the year and the rate that money was put into the fund was higher than the rate of expenditures. It has just slowly worked up to that balance. That balance is not obligated for any projects currently. It was also mentioned that some of the money was earmarked for a couple of projects that have not developed, for instance, the Needs Study.

### **Discussion on May traveling meeting location options**

- The following ideas were discussed as options for the location of the May traveling meeting and will be discussed in more detail at the April meeting:
  - Rob Ettema offered to host the meeting at The University of Iowa and offer a tour showing a number of experiments, which are underway on abutment scour or a tour of the Hydraulics lab.
  - Another option for farther east in the state could be a tour of the River station on the Mississippi, which opened in 2002.
  - Jim Cable mentioned the possibility of the laser profiler running on US 30 by Tama around the end of May, depending on the paving schedule.
  - Roger Gould mentioned touring some of the unique projects being done on I-235. There is an office on East 14<sup>th</sup>, by the capitol, which is a possibility for a meeting location.
  - Mark Nahra mentioned looking at the Board sponsored Hungry Canyon projects that were done in the Loess Hills area.
  - Jeff Krist brought up the possibility of touring the new power plant in Council Bluffs. It is not a Board sponsored project, however, it is currently the largest project in the state and would be interesting to see.
- If anyone has additional ideas, they should be sent to Mark Dunn's office. The Board will make the final decision about the May meeting location at the April meeting.

### **Brainstorming workshop to develop strategic research needs for FY 04-05.**

- The Board members and alternates made suggestions of research topics to be considered for requested research. After the members and alternates, the room was opened up for suggestions from others. These topics, along with the topics that are submitted to Mark Dunn separately from the brainstorming session, will be grouped appropriately and sent out to the members and alternates for initial prioritization.
- March 12 was set as the deadline to submit any additional research topics to Mark Dunn for next fiscal year's priorities. Mark Dunn will then organize the topics and send the ballots out to the Board allowing enough time for initial ranking prior to the deadline of the April Board packet.

### **New Business**

- It was brought to the Board's attention that there was a statement in the "Iowa Bridge Backwater Software" manual for TR-476, "PCVAL: A Computer Program for Valley Stage-Discharge Curves and Bridge Control, Inc. Backwater Calculations", which was felt to be inappropriate for a technical document. This had already been discussed with Dr. Jones, he apologized and it has been revised. Roadgrade overflow calculations had been modified from the initial version of the software as well. Both Version 1.1 of the software and the revised manual were sent out to counties and consultants and the cities received notification via e-mail of the changes plus the web location for downloading the updated software and manual. The software is available on the Bridges and Structures web site.
- The Board was reminded that the Materials-Research website contains a list of all the research projects and many abstracts. All of the newer reports that have been completed are on the website in pdf format. Some of the older reports have been converted to an electronic file and are available. We will continue with the process of converting older reports as time permits.
- The Materials-Research web address is [www.dot.state.ia.us/materials/research/research\\_home](http://www.dot.state.ia.us/materials/research/research_home).

- There was a request that the labels be left off of the Board packet CDs. They are causing problems with some machines.

**Greg Parker adjourned the meeting.**

**Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, APRIL 23, 2004 AT 9:00 A.M. IN THE EAST/WEST MATERIALS CONFERENCE ROOM AT THE IOWA DOT, CENTRAL COMPLEX, IN AMES, IOWA.**

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Mark Dunn, IHRB Secretary